



ON DISSECTING ANEURYSM OF THE AORTA.

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## ON DISSECTING ANEURYSM OF THE AORTA.

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(PLATES I.—III.)

CASES of dissecting aneurysm are of sufficient rarity as doubtless to justify the record of the following striking example, which has recently come under my observation in the Pathological Department of the Manchester Royal Infirmary.

The patient was a married woman, *æt.* 50.

**CLINICAL HISTORY.**—She had suffered from “rheumatic” pains for years. About a year ago she strained herself while lifting a heavy bundle of clothes, and experienced a sudden pain in the chest. This compelled her to remain in bed for several weeks, but the pain in the chest persisted, although less severe. At this time also there were pains about the body, thought to be of a “rheumatic” nature. After some weeks she was able to get about again, but never recovered thoroughly, and suffered especially from palpitation and shortness of breath. She gradually got weaker, and stated that she used to sweat profusely and passed large quantities of pale-coloured urine. Latterly the symptoms became much worse, anasarca and ascites developing.

For some time she was under the care of Dr. Fenn, as an out-patient to the Hospital for Diseases of the Chest, then under Mr. Pritchard as a home-patient; and to these gentlemen, and to Dr. Bateman, house physician to the Royal Infirmary, I am indebted for details of the clinical history.

Three days before her death she was admitted to Dr. Dreschfeld’s wards of the Manchester Royal Infirmary, through whose kindness I have been enabled to investigate the case. She was then extremely ill. There was great dyspnoea and extensive dropsy. The pulse was very feeble, irregular in force and rhythm, and numbered 160. There was a systolic murmur over the cardiac apex.

The following is a summary of my post-mortem report:—

**AUTOPSY (EXTERNAL).**—Body that of elderly female. General anasarca; extreme dropsy of lower extremities; prominent abdomen from ascitic distension; hæmorrhages about neck, shoulders, and arms; face cyanosed.

**(INTERNAL) Thorax.**—Pericardium—enlarged; external adhesions to adjacent pleuræ; serous effusion; considerable subepicardial deposit of fat.

**Heart.**—Much enlarged; weight, 21 oz.; cavities and orifices dilated; tricuspid admits seven fingers, mitral four; mitral segments a little sclerosed, with a few warty vegetations; left ventricle greatly enlarged, cavity increased and walls hypertrophied; aortic valve slightly thickened; myocardium soft and flabby.

**Aorta.**—Distinctly atheromatous; 1 in. beyond left subclavian

a small calcified patch; 4 in. below aperture of left subelavian artery and  $1\frac{1}{4}$  in. below level of left bronchus is transverse slit,  $\frac{5}{8}$  by  $\frac{1}{8}$  in.; edges smooth, and not specially thickened; slit leads into fusiform sac formed in wall of aorta,  $3\frac{1}{2}$  in. in length and filled with laminated clot; the sac extends upwards above orifice for  $1\frac{1}{2}$  in., but downwards it narrows and extends in coats of thoracic and abdominal aorta to the bifurcation into the iliaes;  $2\frac{1}{4}$  in. below slit, dissecting aneurysm, lying immediately behind main trunk of aorta, has diameter of  $1\frac{1}{4}$  by  $\frac{3}{4}$  in.; along the abdominal aorta are numerous apertures where the sac of the dissecting aneurysm communicates with the lumen of the aorta; several are no bigger than pin-points, but one,  $\frac{3}{4}$  in. above bifurcation, is  $\frac{1}{2}$  in. in width; the separation of the aortic coats terminates on the right side by opening into the right common iliac 1 in. beyond bifurcation, and on left side by bursting into origin of left common iliac at level of bifurcation of aorta.

Several of the apertures appear to correspond to the orifices of the lumbar arteries; these vessels have been torn in the formation of the sac.

The sac can be seen to be formed by the separation of the layers of the middle coat of the aorta. It is lined more or less throughout by clot and fibrin, the coagulum at the upper part being particularly plentiful. Small vessels, the vasa vasorum, pass across side of sac.

Most of these points can be seen in the accompanying illustrations (Plates I. and II.).

*Pleure.*—Double hydrothorax.

*Lungs.*—Both small, congested, pigmented, and compressed. (Right),  $24\frac{1}{2}$  oz.; (left),  $14\frac{1}{2}$  oz., partially collapsed; upper part of aneurysm adherent to left lung, and bulging towards left pleura.

*Abdomen*—(Peritoneum).—Much ascites; flakes of lymph; band of omentum adherent to uterus. (Stomach and intestines).—Congested. (Liver).—Enlarged,  $56\frac{1}{2}$  oz.; pale, firm consistency; a little irregular on surface; in parts slightly "nutmeg." (Spleen).—Enlarged,  $6\frac{1}{2}$  oz.; firm, congested. (Kidneys).—Small (right),  $4\frac{1}{2}$  oz.; (left), 3 oz.; both somewhat cirrhotic. (Genitals).—Old adhesions about ovaries and tubes. The other organs present no features of particular interest.

Dissecting aneurysm does not appear to have been recognised before the present century.

The *history* of its identification is interesting. Laennec is usually credited with having first described it, but Peacock<sup>1</sup> has shown that, according to Broca, a M. Maunoir employed the same designation, and clearly described the formation of aneurysms of this kind in his work in 1802. In 1809, Burns<sup>2</sup> was the first to draw attention to the lesion in this country. In 1822, Shekelton<sup>3</sup> of Dublin recognised the condition, and several subsequent cases, especially in Ireland, have been spoken of as "Shekelton's

<sup>1</sup> *Trans. Path. Soc. London*, 1862-63, vol. xiv. p. 87.

<sup>2</sup> "Observations on Diseases of the Heart, Aneurysm of the Thoracic Aorta, Preternatural Pulsation in the Epigastric Region, and Unusual Distribution of Arteries," Edin., 1809, p. 231.

<sup>3</sup> *Dublin Hosp. Rep.*, 1822, vol. iii. p. 231.

aneurysm." In 1826, Laennec<sup>1</sup> carefully indicated the nature of the lesions, and recorded cases.

In 1837, Rokitsansky published several cases. By 1843, Peacock was able to collect nineteen examples, and in 1849 he brought the number up to thirty-eight. From that time onwards a considerable number of cases have been recorded.

In this country we are particularly indebted to Peacock<sup>2</sup> for his valuable work in collecting the early cases. In 1863 he published a tabular synopsis of eighty cases, which indeed forms the basis of our knowledge of this curious lesion.

Since 1863 a comparatively small number of cases have been recorded, the most important in this country being those of—Ball,<sup>3</sup> Barker,<sup>4</sup> Bennett,<sup>5</sup> Box,<sup>6</sup> Coats,<sup>7</sup> Fagge,<sup>8</sup> Finny,<sup>9</sup> Gordon,<sup>10</sup> Haden,<sup>11</sup> Horsley,<sup>12</sup> Jollye,<sup>13</sup> Legg,<sup>14</sup> Leggat,<sup>15</sup> MacMullen,<sup>16</sup> Newman,<sup>17</sup> Oliver,<sup>18</sup> Rolleston,<sup>19</sup> Symes,<sup>20</sup> Turner,<sup>21</sup> West,<sup>22</sup> Whipham,<sup>23</sup> and Williams.<sup>24</sup>

A number of cases have also been met with on the Continent, and the lesion has formed the subject of several graduation dissertations.

As regards *frequency*, one may safely claim that the lesion is rare. Among nearly 1700 cases, which have been investigated in our pathological department during the period I have acted as pathologist, only this one example has been met with. Judged also by the cases in museums, the lesion is rare. It would probably be more frequently met with if cases of "sudden death" were more systematically submitted to thorough investigation. A very fine specimen was handed me by my friend, Dr. Brindley,

<sup>1</sup> "Traité de l'auscultation médiate," 1826, tome ii. p. 692.

<sup>2</sup> *Edin. Med. Journ.*, 1843, vol. ix. p. 276; *London and Edin. Month. Journ. Med. Sc.*, 1843, vol. iii. p. 871; *ibid.*, 1848-49, vol. ix. p. 1052; *Trans. Path. Soc. London*, 1848-50, vol. ii. p. 42; *ibid.*, 1863, vol. xiv. p. 87; *ibid.*, 1866, vol. xvii. p. 50; *ibid.*, 1874, vol. xxv. p. 59.

<sup>3</sup> *Dublin Hosp. Gaz.*, 1857, vol. iv. p. 243.

<sup>4</sup> *Med.-Chir. Trans.*, London, 1860, N. S., vol. xxv. p. 131.

<sup>5</sup> *Ibid.*, 1849, vol. xxxii. p. 157.

<sup>6</sup> *St. Thomas' Hosp. Rep.*, London, 1894, N. S., vol. xxii. p. 180.

<sup>7</sup> "Manual of Pathology," London, 1895, p. 492.

<sup>8</sup> *Med.-Chir. Trans.*, London, 1869, vol. lii. p. 341.

<sup>9</sup> *Dublin Journ. Med. Sc.*, 1885, Ser. 3, vol. lxxx. pp. 159-276.

<sup>10</sup> *Proc. Path. Soc. Dublin*, 1864-65, N. S., vol. ii. p. 84.

<sup>11</sup> *Ibid.*, 1871-74, N. S., vol. v. p. 1.

<sup>12</sup> *Lancet*, London, 1875, vol. i. p. 758.

<sup>13</sup> *Ibid.*, 1889, vol. ii. p. 430.

<sup>14</sup> *Trans. Path. Soc. London*, 1869, vol. xx. p. 130; *ibid.*, 1878, vol. xxix. p. 65.

<sup>15</sup> *Ibid.*, 1866, vol. xvii. p. 52.

<sup>16</sup> *Dublin Journ. Med. Sc.*, 1885, Ser. 3, vol. xl. p. 424.

<sup>17</sup> *Glasgow Med. Journ.*, 1883, vol. xx. p. 456.

<sup>18</sup> *Lancet*, London, 1892, vol. i. p. 1068.

<sup>19</sup> *Trans. Path. Soc. London*, 1892-93, vol. xlv. p. 38.

<sup>20</sup> *Dublin Journ. Med. Sc.*, 1864, vol. xxxvii. p. 466.

<sup>21</sup> *Trans. Path. Soc. London*, 1884-85, vol. xxxvi. p. 152.

<sup>22</sup> *Ibid.*, 1882-83, vol. xxxiv. p. 65.

<sup>23</sup> *Ibid.*, 1871, vol. xxii. p. 113.

<sup>24</sup> *Ibid.*, 1864, vol. xv. p. 79.



who, when resident medical officer at the Infirmary, discovered a dissecting aneurysm, involving the arch of the aorta, in a case he was investigating outside the hospital for the coroner.

The subject was a labourer at a railway station and aged about 40. He was suddenly taken ill while at work, and died almost immediately.

At the autopsy the pericardium was found distended with blood. The character of the aneurysm is indicated in the accompanying illustration (Plate III.). The specimen has been added to the pathological collection of the Owens College. The same museum also contains other examples of dissecting aneurysm.

As regards *etiology*, our knowledge is somewhat imperfect. In many of the recorded cases the symptoms have, as in the above case, dated from a sudden strain.

With regard to *predisposing influences*, one may be a little more definite.

As to *sex*, the female seems certainly, as regards proportion, more liable than in the case of ordinary varieties of aneurysm.

The *age* was found by Peacock to vary from 17 to 95. Most cases, however, seem to occur in advanced middle life.

*Occupation* is of importance, in so far as it leads to vascular degenerative changes, or produces strain and sudden injury.

*Disease of the vessel walls* is of course the essential predisposing cause. Atheroma seems to be the most important lesion. Other forms of aortitis, including those of syphilitic origin, are also probably of etiological influence.

In some cases, however, there has been but little apparent disease of the aorta, and some have thought that in these instances the internal coats were abnormally fragile, and lacerated from influences not sufficient to produce tearing in an aorta of normal resilience.

A high arterial pressure may also be a factor of importance in some few cases.

As regards the *nature* of the lesion, the aneurysm consists of a separation of the coats of the vessel. This stripping apart of the coats usually occurs in the laminae of the middle coat. It used to be said that the separation occurred between the middle and external coats, but this is probably never the case.

The *situation and form of the aperture* varies. The commonest seat for rupture is just above the aortic valve. It may, however, be met with in any part of the vessel. In some it has been near the origin of the innominate artery. In others it was a little beyond the left subclavian artery, as in my case. It is very rare in the abdominal aorta.

In form the aperture is generally slit-like. It may be transverse, oblique or vertical.

The *area of separation*—that is to say, the size of the aneurysm—varies. Usually it is from one-half to two-thirds of the circum-

ference of the aorta. Occasionally the separation may extend to vessels arising from the aorta. This is especially the case with the large arteries originating from the arch.

The *extent* of the dissecting aneurysm varies greatly. Peacock has analysed his cases, and indicated his results in tabular form on this point. He only mentions two cases, where, as in my case, the internal rupture, situated at the commencement of the descending thoracic aorta and beyond the origin of the left subclavian artery, reached to the iliaes.

Three *varieties* may be recognised—(1) Where the separation forms a blind sac in the walls of the vessel; (2) where the sac has opened by one or more apertures into the lumen of the vessel; (3) where the aneurysm has burst through the external boundaries.

The *clinical features* are usually not distinctive. But few of the cases have been diagnosed. There are no special or peculiar signs or symptoms. Cardiac manifestations have been conspicuous in some instances, such as cardiac pain, angina, dyspnoea, anaemia, cyanosis, and the usual indications of cardiac failure. In not a few cases death has been “unexpected” and often “sudden.”

*Treatment* must manifestly be purely symptomatic.





Dissecting aneurysm. Portion of arch and descending thoracic aorta to the left ; abdominal aorta and iliacs to right. Aorta laid open throughout. Bougies passed down sac of aneurysm in abdominal portion of aorta. Slit-like aperture in thoracic aorta with sac opposite bulging towards left pleura. Several apertures in abdominal aorta and terminal orifices in common iliacs. Atheromatous patches.





Dissecting aneurysm. Sac laid open and viewed from behind. Clot and layers of fibrin on walls. Holes indicating communications between sac and aorta. Stretched vasa vasorum.





Dissecting aneurysm of arch of aorta. From a man æt. 40. The sac of aneurysm formed by separation of middle coat is propped open by pin. A pencil is placed in lumen of aorta. For the photographs from which these illustrations have been prepared I am indebted to my brother, Mr. W. S. Kelynack.



